NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594

November 12, 2013

MATERIALS LABORATORY FACTUAL REPORT Report No. 13-092

A. ACCIDENT INFORMATION

Place	:	San Francisco, California
Date	:	July 6, 2013
Vehicle	:	Boeing 777-200ER
NTSB No.	:	DCA13MA120
Investigator	:	Peter Wentz

B. COMPONENTS EXAMINED

Piece of overhead bin vertical tie rod attach from STA1874 B/L +/- 31.70, W/L 288.70

M4A attendant jump seat restraint harness (Pacific Scientific Flight P/N 1117556-200-225, manufactured 01/11)

C. DETAILS OF THE EXAMINATION

Images of the piece of the vertical tie rod attach are shown in Figure 1. Higher magnification macrographs of the fracture surfaces are shown in Figure 2. Fractographic analysis reveals river patterns indicating that both fractures initiated at the periphery of the hole on one side of the piece and propagated through the thickness in a manner consistent with cantilever bending. Examination under a 5X to 50X stereo zoom microscope revealed fractographic features consistent with overstress loading. No preexisting damage such as a fatigue crack was observed.

Front and back views of the M4A attendant jump seat restraint harness are shown in Figures 3 and 4, respectively. Visual inspection revealed both lap belt shackles (fabricated from anodized aluminum alloy) to be damaged. The inboard shackle was bent in a manner consistent with the application of a tension force in the webbing at a vector ranging to about 45° from the major axis of the shackle away from the seat. As shown in Figure 5b about 5% of the black anodic coating spalled from the surface along the compression side of the axes of bending.

The outboard shackle was bent in a manner consistent with the application of a tension force in the webbing at a vector ranging to about 45° from the major axis of the shackle away from the seat. The axes of bending are similar to that noted in Figure 5b. As revealed in Figure 6a, the shackle fractured in three places. Examination under a 5X to 50X stereo zoom microscope, indicates that the fracture features are consistent with

combined tension and bending overstress loading. Observed in Figure 6b, about 5% of the black anodic coating spalled from the surface along the compression side of the axes of bending. No preexisting damage such as a fatigue crack was observed.

For documentation purposes, the identification label on the harnesses listed the following (see Figure 7):

PACIFIC SCIENTIFIC 45402
DUARTE, CA 91010
PN 1117556-100-225
NA 2100002-100-225
FA2100002-01-225
DATE OF MFG. 01/11
RATED STRENGTH 2500 LBS
CONFORMS TO FAA-TSO C114

Michael Budinski
Chief, Materials Laboratory

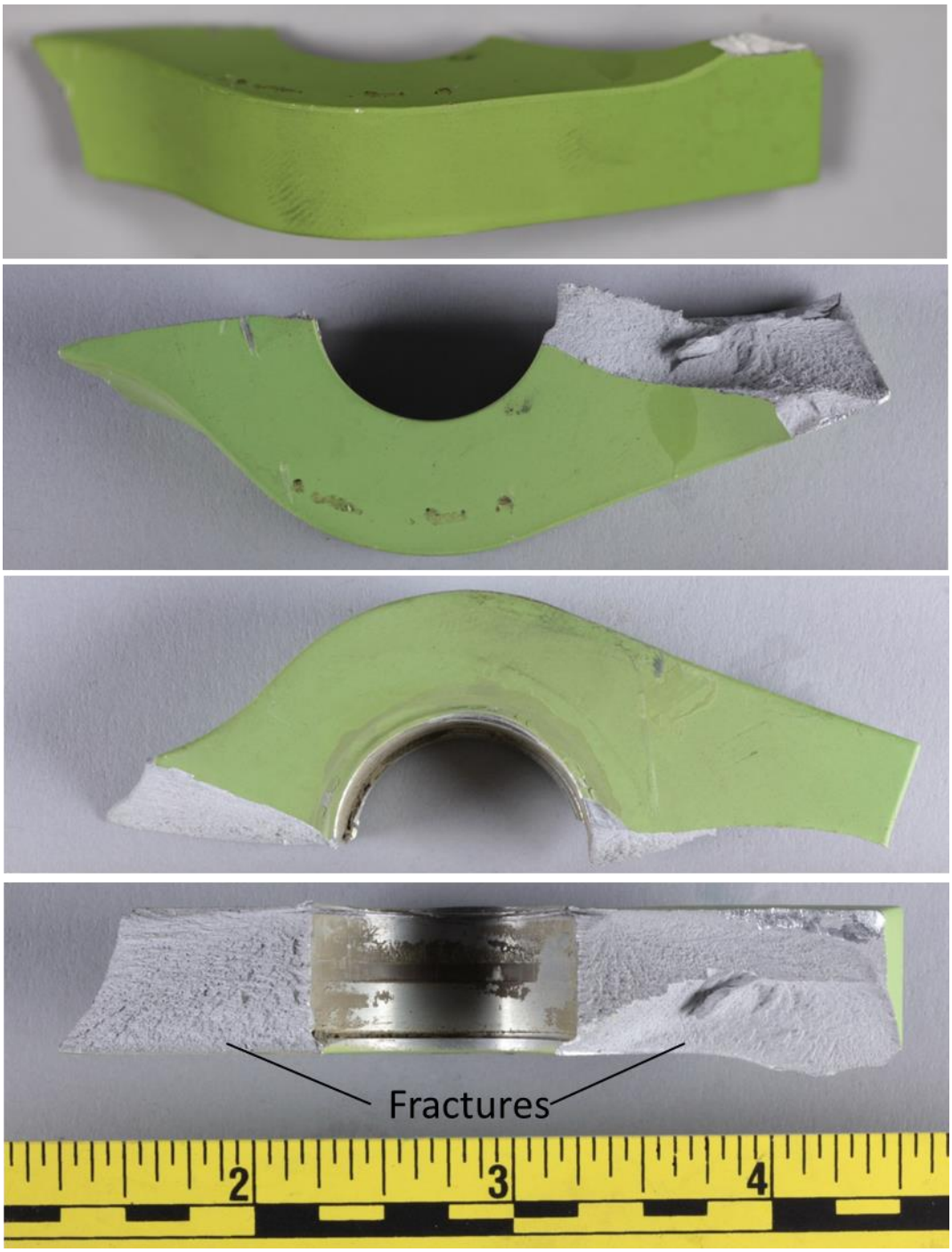

Figure 1 Views of the piece of overhead bin vertical tie rod attach. The fracture surfaces are identified in the lower-most image.

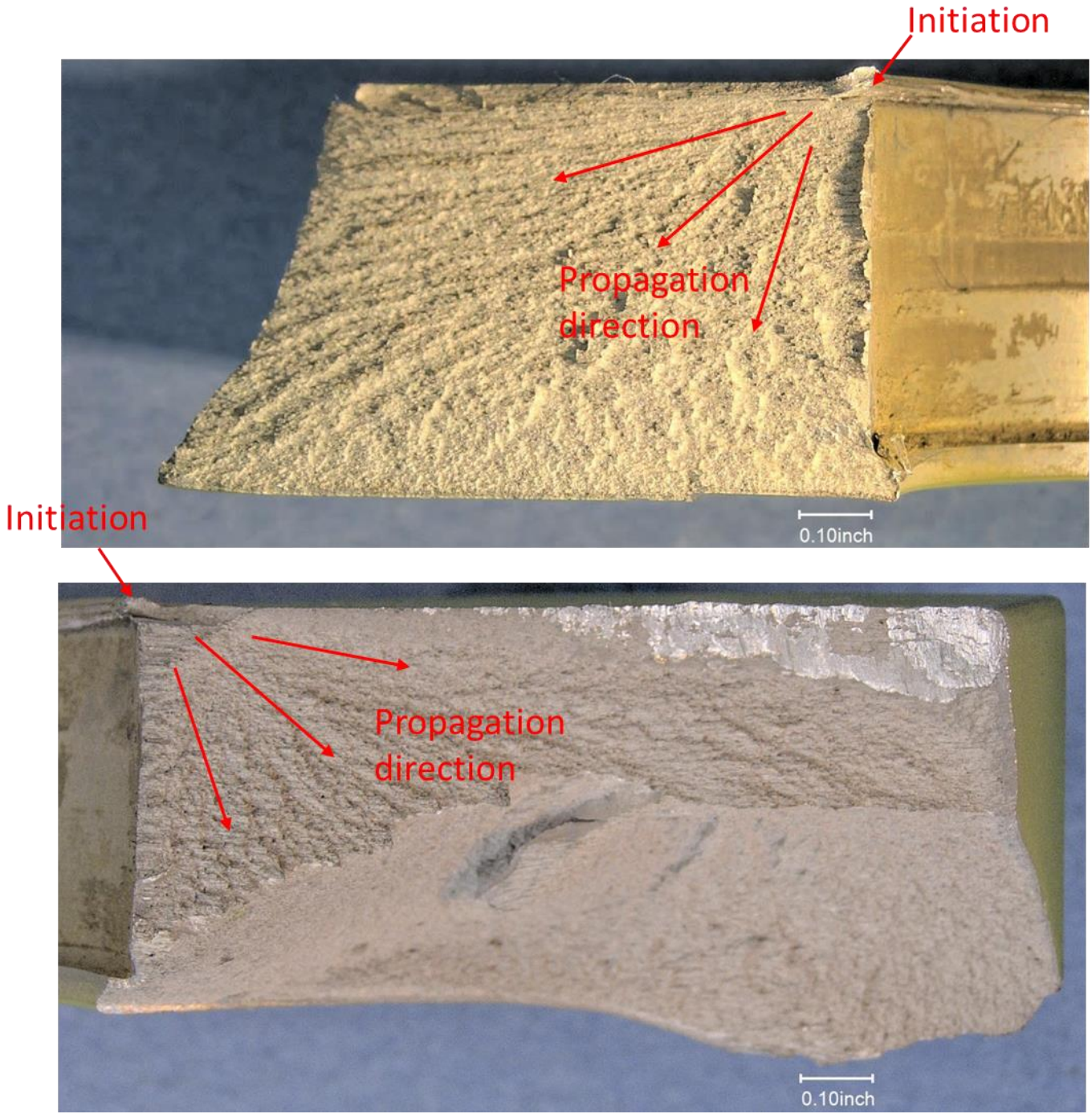

Figure 2 Higher magnification images of the fracture surfaces on the piece of overhead bin vertical tie rod attach. The areas of fracture initiation and crack propagation direction are indicated in the images.

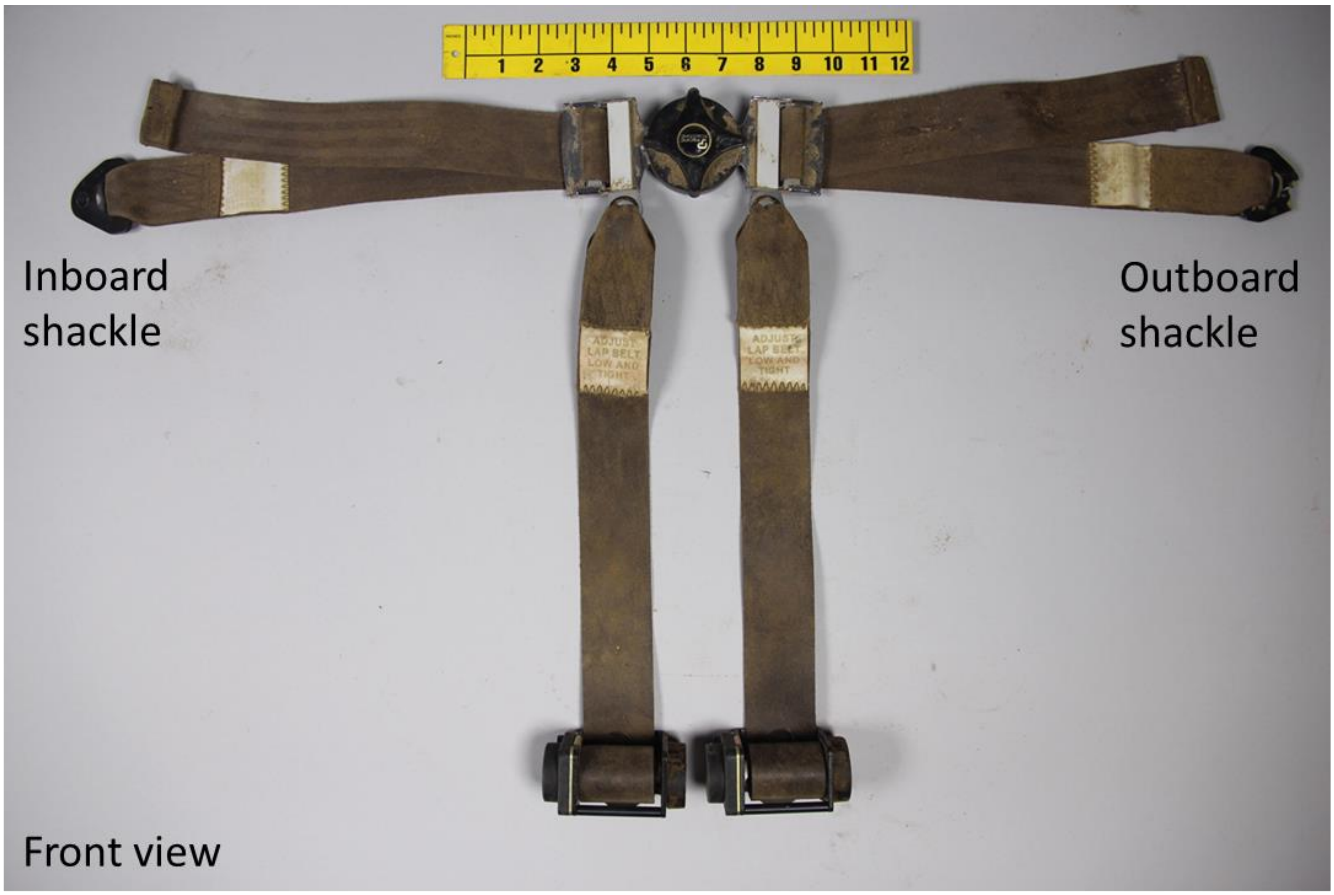

Figure 3 Image of the front view of the M4A attendant jump seat restraint harness.

Figure 4 Image of the back view of the M4A attendant jump seat restraint harness.

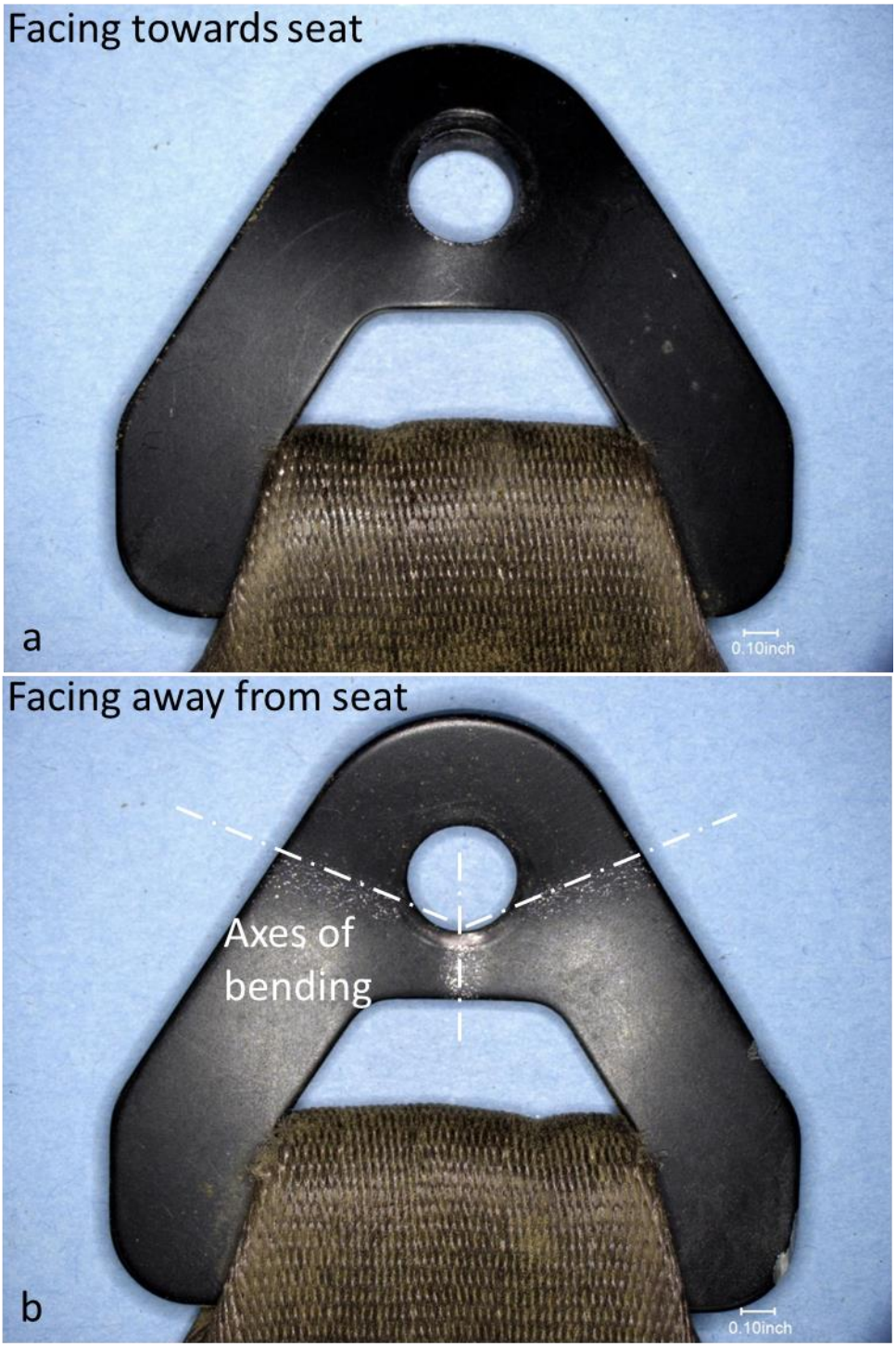

Figure 5 Images of the inboard shackle on the lap belt of the M4A attendant jump seat restraint harness.

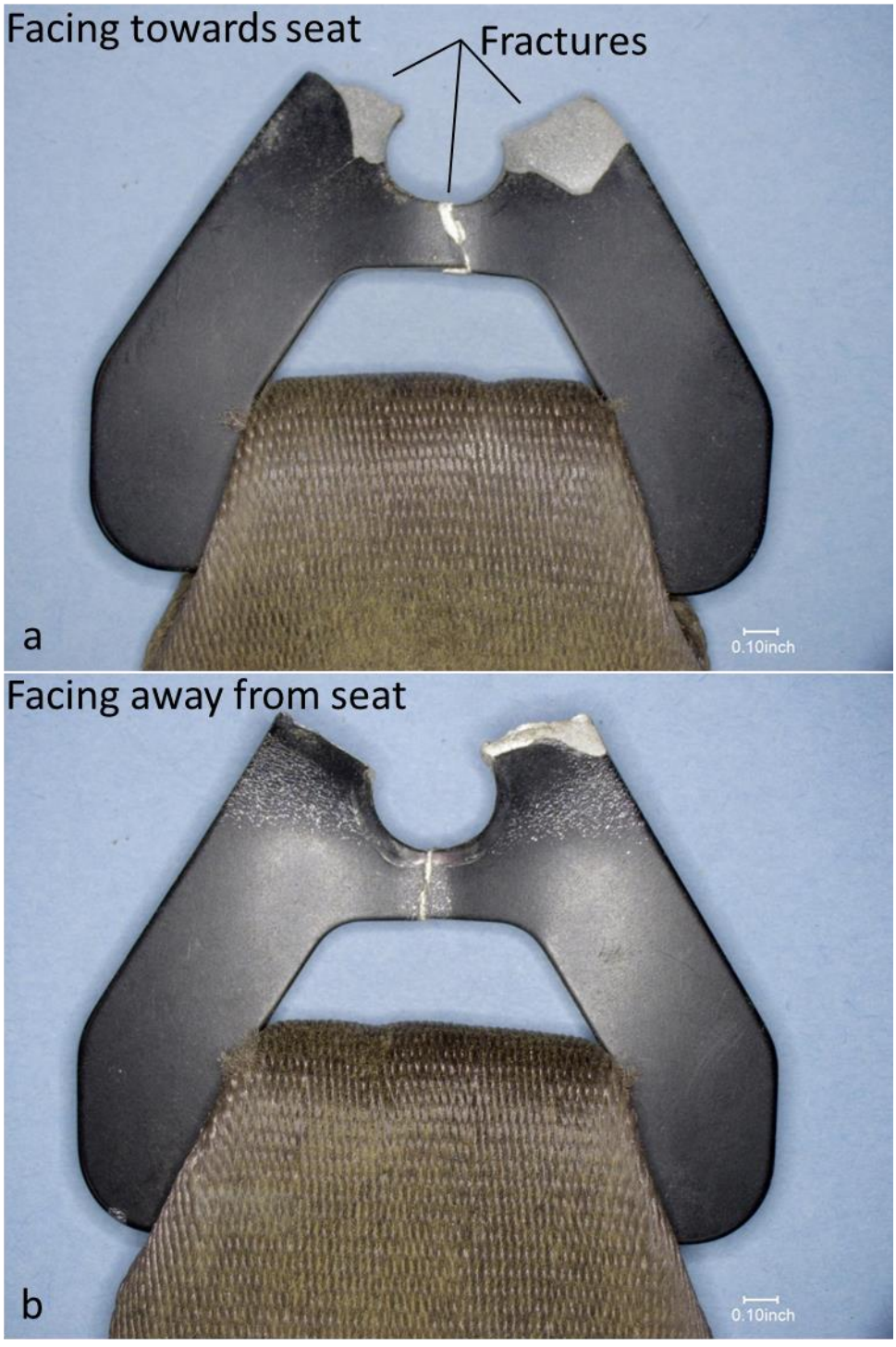

Figure 6 Images of the outboard shackle on the lap belt of the M4A attendant jump seat restraint harness.

Figure 7 Image of the label on the webbing of M4A attendant jump seat restraint harness.